PROGRESS REPORTS

FROM

EXPERIMENT STATIONS

SEASON 1957-58

KENYA

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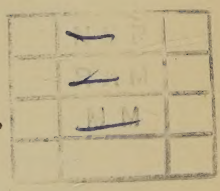

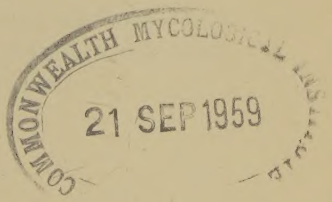

E.C.G.C. STAFF

KIBOS

Plant Breeding and Agronomy ... ... M. S. HASTIE, B.Sc.

KENYA

PROGRESS REPORT FOR THE SEASON 1957-58

	Nyanza Province	*Coast Province*
Planting period	May to August	Mid April to mid June
Picking period	December to early March	October to mid January
Close season	Early March and April	From mid February

NYANZA PROVINCE

BY

M. S. HASTIE.

Introduction.

The layout of the Cotton Experiment Station, Kibos, was redesigned during 1957 to make six fields, each of 3 acres of heavy black clay, for a new agronomy programme. These fields can be irrigated.

Arrangements have been made with the Commissioner of Prisons, Kenya, to utilise part of the New Prison Farm, Kisumu, for pedigree seed production.

Visitors during the season included Mr. J. C. May, C.M.G., O.B.E., Director of the Corporation, and members of the staff from the Sudan, Tanganyika, and Uganda; Professor F. B. Wilson, M.B.E., of Makerere College; Mr. H. G. Porter, Chief of the Foreign Competition Branch, Cotton Division, U.S. Department of Agriculture; Mr. R. J. M. Swynnerton, O.B.E., Director of Agriculture, Kenya; Mr. A. R. Melville, Chief Research Officer, and Dr. R. le Pelley, Senior Entomologist, Kenya Department of Agriculture, and Mr. T. Hughes Rice, M.B.E., Assistant Director of Agriculture, Nyanza Province.

Mr. T. J. Crowe returned from overseas leave in July, and from September until December lectured at Egerton Agricultural College, Njoro. Mr. M. S. Hastie attended the Coast Provincial Experimental Meeting at Mombasa, and Mr. Crowe attended the Specialist Entomological and Insecticides Meeting at Kawanda, Uganda. Visits were made to the Malindi cotton area, the Hola and Mwea/Tebere irrigation projects, and the Cotton Research Station, Namulonge, Uganda.

Rainfall.

Rainfall during the season was satisfactory in Elgon and Central Nyanza, but in a large part of South Nyanza the cessation of the main rains during May seriously affected yields of the later plantings which comprised the bulk of the crop. The rain during February did some damage to the late pickings in Central and Elgon Nyanza.

TABLE 1.

RAINFALL IN INCHES.

Month	*Elgon Nyanza*		*Central Nyanza*	*South Nyanza*
	Busia Cotton substation	*Itesio Lepro-sarium*	*Kibos Main station*	*Homa Bay Cotton substation*
April 1957	8·52	6·59	9·12	5·10
May	7·40	12·27	8·30	7·37
June	3·36	6·37	2·78	2·75
July	4·47	2·91	2·47	1·04
August	5·33	2·45	2·79	2·34
September	4·21	3·79	1·47	3·04
October	2·89	3·94	2·09	0·73
November	5·78	4·78	5·60	3·45
December	2·82	2·30	5·04	2·13
January 1958	0·81	0·87	0·50	1·29
February	4·57	6·14	4·50	3·39
March	2·65	3·02	5·86	3·97
Total	52·81	55·43	50·52	36·60

TABLE 2.

COTTON PRODUCTION IN NYANZA BY GINNERIES.

Ginneries	*1956-57*			*1957-58*		
	Estimated acreage	*Total 400 lb. bales*	*% BR*	*Estimated acreage*	*Total 400 lb. bales*	*% BR*
South Nyanza	12,000			16,000 (+33%)		
Homa Bay		1,643	8·9		1,058 (−35%)	12·8
Central Nyanza	29,000			40,700 (+40%)		
Kibos		401	19·7		419	30·8
Ndere		993	14·0		1,638	15·2
Ukwamba		2,126	5·5		2,617 (+32%)	11·0
Elgon Nyanza	14,400			20,460 (+42%)		
Nambare		1,506	6·6		1,897	9·4
Malakisi		792	7·6		1,578 (+52%)	10·6
Total	55,400	7,461	9·1	77,160 (+39%)	9,207 (+23%)	12·5

Figures in brackets show percentage change from previous season.

Cotton Crop.

A comparison of the 1957-58 crop with that of the previous season is given in Table 2.

In contrast with the previous season, there was a considerable increase in acreage, but the yield of lint per acre fell from 53·9 lb. to 47·7 lb., and the proportion of B grade increased slightly. There was a marked increase in crop in the Malakisi area which was largely the result of a successful campaign for early planting and bigger acreages. Buying opened in November in South Nyanza and along the Kenya/Uganda border, and early in December elsewhere. Prices paid

to growers were 57 cents per lb. for A grade seed cotton and 22 cents per lb. for B grade.

Increases in production in Central and Elgon Nyanza followed the increased acreages, but in South Nyanza the crop was the poorest of the last three seasons; this can be attributed to late planting and the fact that there was little effective rain after mid May. The seriousness of the situation can be seen when it is realised that the average production per acre was 26·5 lb. of lint or about 87·5 lb. of seed cotton.

Disease.

As in previous years, bacterial blight (*Xanthomonas malvacearum*) was the most prevalent disease. Verticillium wilt (*Verticillium dahliae*) was found in a shamba in the Kano Plain and another in Samia, and at two sites on the Cotton Station, Kibos.

Results of Experiments.

Cotton Insecticide Field Trials, South Nyanza.

At the request of the Nyanza Province Cotton Committee and the Nyanza Province (Kenya) Cotton Association, who also shared the costs, an attempt was made to assess in the field what improvements in yield could be achieved by the use of insecticides for controlling stainers (*Dysdercus* sp.).

At sites throughout the South Nyanza cotton areas, ten relatively early planted peasant shambas were chosen in fairly close proximity. Each of the ten shambas was given one of ten dust treatments. One hundred shambas were used in this series of trials, the results of which are given in Table 3.

Table 3.

Results of insecticide trials.

Treatment	*No. of applications*	*Rate per acre*	*Interval*	*Yield lb. seed cotton per acre*	*Cost of dust*	*Return less cost of dust*
Dust:						
10% DDT	5	16 lb.	10 days	499	64/-	200/-
10% DDT	7	10 lb.	7 days	610	56/-	264/-
10% DDT	4	16 lb.	12 days	548	51/-	229/-
10% DDT +5% BHC	5	16 lb.	10 days	517	66/-	203/-
10% DDT +5% BHC	7	10 lb.	7 days	525	58/-	217/-
10% DDT +5% BHC	4	16 lb.	12 days	540	53/-	232/-
3:10:0 dust	5	16 lb.	10 days	662	84/-	262/-
3:10:0 dust	7	10 lb.	7 days	611	74/-	246/-
3:10:0 dust	4	16 lb.	12 days	687	67/-	297/-
Control		No dust		407	—	193/-

Swaine dusters, costing about 8/-, were used to apply the dusts, and the filler was kaolin.

In the control plots B grade cotton accounted for 27% of the total, whereas in the dusted plots it varied from 11% to 16% and averaged only 13%.

Yield increases from 22% to 68% over control were achieved by the use of these dusts and for consistently good yields it would appear that 3:10:0* cotton dust is the most promising of those under trial.

TABLE 4.

DISTRIBUTION OF SHAMBA SIZES IN DUSTING EXPERIMENT.

Shamba sizes	*No.*
Over 0·1 acre and under 0·2 acre	17
Over 0·2 acre and under 0·3 acre	40
Over 0·3 acre and under 0·4 acre	22
Over 0·4 acre and under 0·5 acre	11
Over 0·5 acre and under 0·6 acre	4
Over 0·7 acre and under 0·8 acre	5
Over 1·0 acre	1
Total	100

Having found the effects of the use of these dusts it is necessary to apply the economics to shamba size. In Table 4 the distribution of sizes of shambas used in these trials shows that 90% were under ½ acre and 57% under 0·3 acre. Applying this evidence to the increased return derived from dusting would indicate that even with the highest yields 57% of the growers would have gained only about 20/-. If these shambas can be regarded as reasonably representative of size distribution, it might be difficult to convince growers that 20/- is an adequate return for the risk of buying dust and applying it. However, two further points arise from these results. The shambas were planted only relatively early, that is, in very late April or early May, and increased yields would have been achieved with plantings in March and early April. The other fact is that while the average yield of the control plots was 407 lb. per acre, the average for the district was 87·5 lb. 27% B grade is not unusual in South Nyanza and the discrepancy between this figure and that given in Table 2, 12·8%, may be due to the fact that with the low yields the growers could not be bothered to pick all their B grade.

This series of trials, carried out entirely under peasant conditions, with supervision only for dusting and weighing, shows the importance of early planting and that dusting early planted cotton can be economic.

Seed Dusting Trial, Kibos.

This trial was conducted at the Cotton Experiment Station, Kibos, under rainfall conditions supplemented by irrigation.

Results were inconclusive but it is apparent that the copper dusts tried to date do not give sufficient protection against primary infection from bacterial blight although there is a considerable reduction of the blackarm phase.

*The 3:10:0 cotton dust used contained 3% gamma BHC and 10% DDT, with kaolin as the filler.

COAST PROVINCE

The experiments described below were performed by the Agricultural Officer (Research) Coast Province, and this report is compiled from information supplied by him and the Provincial Agricultural Officer, Coast Province. It is published by courtesy of the Kenya Government.

Introduction.

Building and clearing at the Cotton Research Station, Msabaha, were completed during the season.

The main rains were well distributed during April and May and also in June in the Malindi area. The totals for the year were higher than those for 1956, but this was largely due to the November/December rains.

Table 5.

Rainfall in inches, 1957.

Month	*Lamu*	*Gede*	*Msabaha*	*Malindi*
January	2·96	4·23	3·68	2·04
February	0·06	—	0·01	—
March	1·75	2·60	1·96	1·06
April	3·90	6·94	4·83	7·10
May	8·90	9·21	9·59	12·49
June	2·84	5·45	5·09	4·68
July	0·95	1·68	1·73	1·90
August	1·00	—	1·26	1·66
September	3·01	2·48	1·75	2·88
October	0·76	1·27	0·50	0·75
November	3·01	7·60	8·61	6·82
December	3·65	4·75	4·21	6·48
Total	32·79	46·21	43·26	47·86

Cotton Crop.

A comparison of production figures of the present crop with that of last season is given in Table 6.

Table 6.

Crop production, coast province, by regions.

Region	*1956*		*1957*	
	Total 400 lb. bales	*%BR*	*Total 400 lb. bales*	*%BR*
Malindi	679	51·4	2,237	19·0
Taveta	37	29·7	88	35·2
Lamu	6	33·3	15	20·0
Total	722	50·1	2,340	19·6

This season Uk51 was planted throughout the Malindi and Lamu areas, while BP52 continued to be grown at Taveta. The prices paid to growers were 60 cents for A grade seed cotton and 20 cents for B grade. The new introduction and the higher price for A grade were largely responsible for the better yields and increased acreage this year.

Results of Experiments.

Variety Trials.

In the Msabaha and Kibarani trials Uk51 and Uk55 were significantly better than N17, and, at Msabaha, Uk 51 significantly outyielded Uk55. The jassid resistance of both Uk51 and Uk55 was very good while that of N17 was negligible. Slight damage was caused by stem girdler, stem borer and *Ramularia*.

Table 7.

Randomised blocks of 12 replications. Plot size 1/80 acre. Flat cultivation. Spacing—rows 3′ apart, holes 1½′ apart, 2 plants per hole.

Yield in lb./acre seed cotton.

	Msabaha Cotton Research Station			*Kibarani District plot*		
Varieties	Uk55	Uk51	N17	Uk55	Uk51	N17
Yield	694	786	569	1177	1151	823
S.E.	23·2			40·6		
L.S.D. (P=0·05)	67			118·1		
Date of planting	9.4.57			20.4.57		

A further variety trial to compare material from Ilonga in Tanganyika was planted at Kibarani on 20th April 1957. The varieties were BSI, 54/145 and 51/77, and their yields were 672 lb., 640 lb. and 517 lb. seed cotton per acre respectively. The differences in yields were not significant. Both BSI and 51/77 showed good jassid resistance, but that of 54/145 was considerably less.

Date of Planting Trial.

A date of planting trial, superimposed on land which was used for a mulch versus no mulch experiment the previous season, was carried out at the Cotton Research Station at Msabaha. There were no significant differences in yields between dates of planting nor residual effects from mulch.

The yields varied from 655 lb. seed cotton per acre to 740 lb., and those from the land which had been mulched the previous season had a mean of 729 lb. as compared with 686 lb. from the unmulched land. Plot size was 1/20th acre. The earliest planted plots suffered from a period of drought after planting, and damage from stem borer, leaf eating caterpillars, aphids and *Ramularia* was fairly severe. Jassid damage was also noticeable. Later plantings did not suffer from drought or heavy attacks from pests and disease. The rains after the later plantings were well distributed. The variety used was Uk51.

Spacing, Thinning and Seed Rate Trial.

In this trial at Msabaha the treatments were: 2 seed rates (5 and 10 seeds per hole); 2 spacings (rows 3′ apart, holes 3′ and 1½′ apart in row); thinning early and late and no thinning. Plot size was 1/74

acre. Spacing at 3′ x 1½′ gave 621 lb. seed cotton per acre compared with 524 lb. for 3′ x 3′. The S.E. was 27 and the L.S.D. (P = 0·05) was 79·3 lb. Other differences were not significant. There were marked differences in fertility between plots.

Manurial Experiment.

In this experiment at Msabaha there were 3 randomised blocks of 3 plots of 1/72 acre, planted with Uk51 on 19th April 1957. Treatments and seed cotton yields were as follows; differences were not significant.

1. Farmyard manure (5 tons) ..... 675 lb.
2. Artificial fertilisers (1 cwt. each sulphate of ammonia and double superphosphate) ..... 663 lb.
3. Control ..... 605 lb.

Tied Ridging Experiment.

8 randomised plots of 1/23 acre were planted at Msabaha on 18th April 1957. Treatments and seed cotton yields were as follows; differences were not significant.

1. Flat cultivation, rows 3′ apart, holes 1½′ apart in row ..... 802 lb.
2. 3′ tied ridges, rows 3′ apart, holes 1½′ apart in row ... 842 lb.
3. 4½′ tied ridges, single row per ridge, holes 1′ apart in row ..... 851 lb.
4. 4½′ tied ridges, 2 rows per ridge, holes 3′ apart in row ..... 858 lb.

Shelter Belt Observation Trial.

In the Coastal cotton area strong winds blow constantly from the sea, and the object of this trial was to see whether any benefit would be obtained by sheltering the cotton crop. The plots were 1/45 acre and were laid in an E.-W. direction; there were two replications of each treatment. Treatments and seed cotton yields were as follows.

1. Complete exposure ..... 610 lb.
2. Shelter by a 12′ wide belt of pigeon pea established the previous season ..... 523 lb.
3. Shelter by a 12′ belt of maize established at the beginning of the 1957 rains ..... 531 lb.
4. Shelter by artificial break erected at times of planting, 5′ high ..... 472 lb.

The provision of shelter markedly improved vegetative growth, but had an adverse effect on yield, probably because insect damage was heavier on sheltered treatments.

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PROGRESS REPORTS FROM EXPERIMENT STATIONS.

The reports for the seasons up to and including 1950-51 were published in seasonal volumes; the following are still in print and available at 3/- per volume post free.

1923-25 (one volume), 1926-27, 1931-32, 1934-35,
1935-36, 1942-43 and 1945-46 to 1950-51.

From 1951-52 the reports from each territory were published individually each season. A few of the 1951-52 reports are out of print, but all others are available post free at 1/- per report or 7/6d. for the seasonal set.